

**REMARKS**

Reconsideration and reexamination are respectfully requested.

**Disposition of the claims.**

Claims 1-14 are pending and stand rejected.

Claim 15 is new, and is supported, e.g., in the present specification as filed on page 3, ll. 16-17. No new matter is added. It is patentable for the same reasons as claim 1.

**§ 102(e) over USPN 7,361,209**

The Examiner rejects claims 1-6 as anticipated under § 102(e) by Durham. Office action, para. 2 (“SOAM”). This rejection is traversed, because Durham cannot be applied against the present claims, and because Durham does not describe an embodiment of the present claims.

*Durham cannot be applied against the present claims.*

The Examiner is asked, for the time being, to accord the effective date of Durham as not earlier than its April 2, 2004, actual filing date. According to its face, Durham was filed April 2, 2004, and it claims the benefit of provisional application no. 60/460,478, filed April 3, 2003. Durham should not be accorded the benefit of the April 3, 2003, date for the purposes of this rejection.

“The subject matter used in the rejection must be disclosed in the earlier-filed application in compliance with 35 U.S.C. 112, first paragraph, in order for that subject matter to be entitled to the earlier filing date under 35 U.S.C. 102(e).” See MPEP § 706.02(f)(1). Here, for example, the Durham-provisional (attached for consideration) certainly lacks the passages cited by the Examiner in this rejection, i.e., col. 4, ll. 4-26. Nor does the Durham-provisional describe in a manner required by §112, first paragraph Durham’s independent claims 1, 10, & 19 (see, e.g., their respective *transporting*, *combusting*, and *milling* steps) and 27 (see, e.g., the *entraining* and *impacting* steps). Thus, the subject matter relied upon by the Examiner cannot be entitled to the earlier filing date of

the Durham-provisional under 35 U.S.C. § 102(e).

As such, the disclosures relied upon by the Examiner are to be accorded, at best, the effective date of Durham, i.e., not earlier than its April 2, 2004, actual filing date.

Because the claims in the present application were already accorded a filing date of December 10, 2003, (see present SOAM, para. 6), Durham's description cannot be applied against the claims of the present invention. Thus the rejection should be withdrawn.

*Durham does not describe an embodiment of the present claims.*

Durham is a rather limited disclosure of optimizing particle size for removing acidic gases contaminants such as sulfur dioxide and hydrogen chloride and some of the air toxics from combusted coal by using particles having an optimized size (Example 1 and Figure 4). The other "air toxics" are NO<sub>x</sub> and SO<sub>x</sub> and may be mercury (see below). The scrubber that is used is finely ground carbon sorbent. It is true that the "further treatment device 116" among the possible sorbents may include a variety of possible sorbents (column 4, lines 10-26), however this is a generic list where only carbon is exemplified and claimed. Cf. MPEP § 2144.08 (concerning obviousness of generic disclosures). No where does Durham exemplify or claim the *removing mercury vapors from waste gas* as recited in claim 1. Thus, Durham does not describe an embodiment of *removing mercury vapors from waste gas* as recited in claim 1.

### **§ 103(a) over Durham**

The Examiner rejects claims 7-11 as obvious over the teaching of Durham. SOAM para. 3. This rejection is traversed, because Durham cannot be applied against the present claims, and because Durham does not render obvious an embodiment of the present claims.

*Durham cannot be applied against the present claims.*

For the reasons noted above, Durham is not part of the scope and content of the prior art, because the Durham-provisional's date does not support in the manner required of § 112 paragraph 1 the disclosures relied upon the Examiner. (It is not believed that additional disclosures are relied upon.) Thus, the present rejection should be withdrawn for this

reason.

*Durham does not render obvious an embodiment of the present claims.*

The use of air from the compressor 218 is for blowing the carbon particles sorbent into the combustion flue. It is not for participating in the process of sorbing the "air toxics" onto the particles. In other words, the air is for obtaining better mixing of the particles and the flue gas and not for participating in the chemistry of the adsorption.

The *removing mercury vapors from waste gas* as recited in claim 1, by analogy, would be done in Durham by using the carbon sorbent, which is not very efficient and indeed not claimed. Column 7, lines 27-43 disclose that "*Typically at least about 50% and more particularly 75% ... typically air toxics are captured by the sorbent particles.*" Durham discloses, at lines 31-37, that "*mercury in the gas 144 leaving the boiler 108 at a concentration of 1-20  $\mu\text{g}/\text{m}^3$  can be collected at an efficiency of 10-99% ... 0.01-18  $\mu\text{g}/\text{m}^3$  of mercury and typically no more than 0.05-10  $\mu\text{g}/\text{m}^3$  of mercury.*" In case we refer to the typically, then from 1  $\mu\text{g}/\text{m}^3$  to 0.05  $\mu\text{g}/\text{m}^3$  gives a removal of 95% and from 20  $\mu\text{g}/\text{m}^3$  to 10  $\mu\text{g}/\text{m}^3$  gives a removal to 50%. The present invention, on the other hand makes it possible to achieve *removing mercury vapors from waste gas* as recited in claim 1 up to 100% of the *mercury vapors*, e.g., as exemplified in all 6 examples.

Furthermore, turning to Durham's Figure 4, the figure does not give total removal percentages but rather the "measured mercury removal **rate** measured as a percentage removed between the upstream sampling location and downstream sampling location" (column 8, lines 2-4) (emphasis added).

Finally, regarding claims 7-8, the Examiner's reliance on *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) is noted, but the Examiner's attention is directed to the principle that "[t]he structure implied by the process steps should be considered when assessing the patentability of product-by-process claims..." MPEP § 2113. Also, regarding claims 9-11, ranges cannot be "optimized," unless the prior art recognizes that the variable to be optimized is a result-effective variable. *In re Antonie*, 559

F.2d 618, 620, 195 USPQ 6,8 (CCPA 1977).

Therefore, claims 7-11 are non-obvious over the teachings of Durham as these claims are dependent on claim 1.

**§ 103(a) over Durham in view of USPN 3,953,586 (Tanimura)**

Claim 12 was rejected as obvious over the teachings of Durham in view of those of Tanimura. SOAM, para. 4. Tanimura was not relied upon to remedy the deficiencies of Durham. Thus, the present rejection should be withdrawn for the same reasons noted above for Durham itself.

Furthermore, Tanimura pertains to purifying gases containing H<sub>2</sub>S or H<sub>2</sub>S and small amounts of SO<sub>2</sub> (thereby producing elemental sulfur). This is not relevant to the present invention. The sulfoxides of Tanimura contain the contaminated "H<sub>2</sub>S and small amounts of SO<sub>2</sub>," where the sulfoxides of the present invention are contaminated with mercury. What the Examiner is thus alleging is that the regeneration of pure sulfoxides from the sulfoxides:mercury combination may be taught from the purification of sulfoxides from the sulfoxides: "H<sub>2</sub>S and small amounts of SO<sub>2</sub>," which is a rather big theoretical or intellectual jump, i.e., an unpredictable jump. Therefore, claim 12 that depends on claim 3 (which in turn depends on claim 1) is not suggested by the combination of Durham and Tanimura.

**§ 103(a) over Durham in view of USPN 6,942,840 (Broderick)**

Claims 13-14 were rejected as obvious over the teachings of Durham in view of those of Broderick. SOAM, para. 5. Broderick was not relied upon to remedy the deficiencies of Durham. Thus, the present rejection should be withdrawn for the same reasons noted above for Durham itself.

Furthermore, Broderick pertains to removal of mercury using oxidating agents, where several possible oxidating agents are disclosed in column 4, lines 55-65. Figure 3 discloses such oxidating agents and their efficiency. Nowhere are sulfoxides disclosed and therefore the use as in the present invention of sulfoxides to remove mercury or the use of sulfoxides in an oxidative environment to remove mercury is not disclosed, hinted or

suggested by Broderick. As claims 13 and 14 depend on claim 1, Applicants cannot see any reason how the combined disclosures of Durham and Broderick render claims 13 and 14 obvious. The present invention and the disclosures of Durham and Broderick are different systems, aiming at different goals and using different types of chemistry and the connection the Examiner made seems unpredictable. Thus, the present rejection should be withdrawn for this reason.

**Conclusion**

The application is believed in condition for allowance.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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